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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/565,598	07/28/2006	Javier Vazquez	GJE-003	2291

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EXAMINER	
KARACSONY, ROBERT	

ART UNIT	PAPER NUMBER
2821	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/565,598	VAZQUEZ ET AL.	
	Examiner	Art Unit	
	ROBERT KARACSONY	2821	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 July 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 July 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *01/24/2006*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. A series of singular dependent claims is permissible in which a dependent claim refers to a preceding claim which, in turn, refers to another preceding claim.

A claim which depends from a dependent claim should not be separated by **any claim** which does not also depend from said dependent claim. It should be kept in mind that a dependent claim may refer to any preceding independent claim. In general, applicant's sequence will not be changed. See MPEP § 608.01(n).

2. Claim 1 is objected to because of the following informalities: In line 5, claim1, the limitation "the surface impedance" lacks proper antecedent basis. For examination purposes, Examiner interprets the limitation as --a surface impedance--. Appropriate correction is required.

3. Claim 23 is objected to because of the following informalities: In lines 3 and 4, claim 23, Applicant recites the limitations, "the bottom layer", "the opposite boundary" and "the sides", which all lack proper antecedent basis. For examination purposes, Examiner interprets the limitations as, "a bottom layer", "an opposite boundary" and "sides", respectively. Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 20-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite in that it fails to point out what is included or excluded by the claim language. This claim is an omnibus type claim. In line 2, claim 20, Applicant recites the limitation "a first device according

to claim 1", which renders the claim indefinite. It is unclear to the Examiner what features in claim 1 the first device is in accordance to. Applicant is advised to specify the limitations of claim 1 that the first device of claim 20 requires. For examination purposes, Examiner interprets "a first device according to claim 1" as a device for controlling electromagnetic radiation.

6. Claims 21-24 are rejected for depending on rejected claim 20.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1-3, 6 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by *Sanchez et al.* (US 2003/0112186, hereinafter *Sanchez*).

Claim 1: *Sanchez* teaches a device for controlling electromagnetic radiation emitted by a structure, the device having a reactive element (102, fig. 1) comprising an array of conductors (110, fig. 1) disposed on a dielectric surface (104, fig. 1) such that the displacement between a conductor and any other conductor adjacent to it is small compared to the wavelength of the electromagnetic radiation thereby causing the array of conductors to represent an effectively continuous conductive surface to the electromagnetic radiation (paragraphs [0003]-[0006]), wherein a surface impedance of the conductive surface is reactive (paragraph [0006]).

Claim 2: *Sanchez* teaches the dielectric surface of the reactive element is planar (fig. 1).

Claim 3: *Sanchez* teaches the electromagnetic radiation has more than one wavelength (paragraph [0003]).

Claim 6: *Sanchez* teaches the surface impedance of the reactive element is capacitive (paragraph [0006]).

Claim 9: *Sanchez* teaches the conductors of the reactive element are substantially periodically disposed with respect to each other on the dielectric surface (fig. 1).

9. Claims 1 and 5-8 rejected under 35 U.S.C. 102(b) as being anticipated by *Wilhelm et al.* (US 2003/0142036, hereinafter *Wilhelm*).

Claim 1: *Wilhelm* teaches a device for controlling electromagnetic radiation emitted by a structure, the device having a reactive element (FSS surface of *Wilhelm*) comprising an array of conductors (cells in fig. 3C) disposed on a dielectric surface (paragraph [0056] teaches disposing the FSS on a dielectric substrate, see also fig. 9) such that the displacement between a conductor and any other conductor adjacent to it is small compared to the wavelength of the electromagnetic radiation thereby causing the array of conductors to represent an effectively continuous conductive surface to the electromagnetic radiation (characteristics of an FSS represent an effectively continuous conductor, also, paragraph [0057] teaches using the FSS as a reflector , therefore, it must inherently act as a sheet conductor to reflect electromagnetic waves), wherein a surface impedance of the conductive surface is reactive (paragraph [0052]).

Claim 5-7: *Wilhelm* teaches the surface impedance of the reactive element is capacitive, inductive and capacitive in some regions of the dielectric surface and inductive in the remaining regions of the dielectric surface (paragraph [0052]).

Claim 8: *Wilhelm* teaches the magnitude of the surface impedance of the reactive element varies at different positions on the dielectric surface (paragraph [0048]).

10. Claims 1 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by *Sievenpiper et al.* (US 2003/0052834, hereinafter *Sievenpiper*).

Claim 1: *Sievenpiper* teaches a device for controlling electromagnetic radiation emitted by a structure, the device having a reactive element (high impedance surface of *Sievenpiper*) comprising an array of conductors (12, fig. 1) disposed on a dielectric surface (paragraph [0049]) such that the displacement between a conductor and any other conductor adjacent to it is small compared to the wavelength of the electromagnetic radiation thereby causing the array of conductors to represent an effectively continuous conductive surface to the electromagnetic radiation (characteristics of a Hi-Z surface represent an effectively continuous conductor, also, see paragraph [0043]), wherein a surface impedance of the conductive surface is reactive (paragraph [0043]).

Claim 4: *Sievenpiper* teaches the electromagnetic radiation has more than one polarization (Abstract).

11. Claims 10-13 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by *Iwai Masato* (JP04269001, hereinafter *Iwai*).

Claim 10: *Iwai* teaches an antenna comprising a conductive equipotential surface (2, fig. 1); a device (device of fig. 1) for controlling electromagnetic radiation emitted by a structure (Abstract), the device having a reactive element comprising an array of conductors (1, fig. 1) disposed on a dielectric surface (support element of power radiation slit plate 1) such that the displacement between a conductor and any other conductor adjacent to it is small compared to

the wavelength of the electromagnetic radiation thereby causing the array of conductors to represent an effectively continuous conductive surface to the electromagnetic radiation (since there will be capacitance induced between the slits of plate 1, the power radiation slit plate will represent an effectively continuous conductive surface), wherein a surface impedance of the conductive surface is reactive (capacitance is reactive) the reactive element of which is disposed parallel to the equipotential surface (fig. 1); an emitter for emitting electromagnetic radiation (18, fig. 1) that is guided between the equipotential surface and the reactive element; and an actuating mechanism (10) for adjusting the displacement between the equipotential surface and the reactive element so that the angle of propagation of a beam of electromagnetic radiation that leaks through the reactive element can be varied (Abstract).

Claim 11: *Iwai* teaches a method of directing a beam of electromagnetic radiation using an antenna according to claim 10, the method comprising causing the emitter to emit electromagnetic radiation; guiding the electromagnetic radiation between the equipotential surface and the reactive element; and adjusting the displacement between the equipotential surface and the reactive element using the actuating mechanism so that the angle of propagation of the beam of electromagnetic radiation that leaks through the reactive element is set to a predetermined value (Abstract).

Claim 12: *Iwai* teaches a method of scanning a beam of electromagnetic radiation using an antenna according to claim 10, the method comprising causing the emitter to emit electromagnetic radiation; guiding the electromagnetic radiation between the equipotential surface and the reactive element; and cyclically varying the displacement between the equipotential surface and the reactive element using the actuating mechanism so that the angle of

propagation of the beam of electromagnetic radiation that leaks through the reactive element oscillates between two values (Claim 12 is considered a suggested use limitation and is not given any patentable weight. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex Parte Masham, 2 USPQ F.2d 1647 (1987).).

Claim 16 is considered a suggested use limitation and is not given any patentable weight. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex Parte Masham, 2 USPQ F.2d 1647 (1987).

12. Claims 1, 13, 18 and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by *Noujeim* (US 7,002,517, hereinafter *Noujeim*).

Claim 1: *Noujeim* teaches a device for controlling electromagnetic radiation emitted by a structure, the device having a reactive element (Abstract) comprising an array of conductors (530, fig. 5) disposed on a dielectric surface (520, fig. 5) such that the displacement between a conductor and any other conductor adjacent to it is small compared to the wavelength of the electromagnetic radiation thereby causing the array of conductors to represent an effectively continuous conductive surface to the electromagnetic radiation (Abstract), wherein a surface impedance of the conductive surface is reactive (Abstract).

Claim 13: *Noujeim* teaches an antenna comprising a conductive equipotential surface (510, fig. 5); using a device according to claim 1, wherein the reactive element of which is disposed parallel to the equipotential surface (fig. 5); an emitter (640, fig. 6) for emitting

electromagnetic radiation that is guided between the equipotential surface and the reactive element; and a layer of active dielectric material disposed between the equipotential surface and the reactive element wherein the angle of propagation of a beam of electromagnetic radiation that leaks through the reactive element can be varied by adjusting a biasing potential across the layer of active dielectric material (Abstract).

Claims 18: *Noujeim* teaches a method of directing a beam of electromagnetic radiation using an antenna according to claim 13, the method comprising causing the emitter to emit electromagnetic radiation; guiding the electromagnetic radiation between the equipotential surface and the reactive element; and adjusting the biasingbiaaain8 potential across the equipotential surface and the reactive element so that the angle of propagation of the beam of electromagnetic radiation that leaks through the reactive element is set to a predetermined value (Abstract).

Claim 19: *Noujeim* teaches a method of scanning a beam of electromagnetic radiation using an antenna according to claim 13, the method comprising causing the emitter to emit electromagnetic radiation; guiding the electromagnetic radiation between the equipotential surface and the reactive element; and cyclically varying the biasing potential across the equipotential surface and the reactive element so that the angle of propagation of the beam of electromagnetic radiation that leaks through the reactive element oscillates between two values (Claim 19 is considered a suggested use limitation and is not given any patentable weight. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex Parte Masham, 2 USPQ F.2d 1647 (1987).).

13. Claims 20-24 are rejected under 35 U.S.C. 102(b) as being anticipated by *Yamamoto* (JP2002374123, hereinafter *Yamamoto*).

Claim 20: *Yamamoto* teaches an antenna comprising a conductive cavity (cavity surrounded by four metal walls 27, 28, 31, 32, see fig. 3), one boundary of which comprises a first device (23 and 35, fig. 3) according to claim 1, the reactive element of which is adapted to present a capacitive surface impedance (metal strips 35 will induce a capacitance between each strip, thus, presenting a capacitive surface impedance); and an emitter (33, fig. 1) disposed within the cavity for emitting electromagnetic radiation.

Claim 21: *Yamamoto* teaches a boundary of the cavity opposite the reactive element of the first device is an equipotential surface (21, fig. 2).

Claim 22: *Yamamoto* teaches a boundary of the cavity opposite the reactive element of the first device comprises a second device (21, fig. 2), the reactive element of which is adapted to present a capacitive surface impedance (metal strips 35 will induce a capacitance between each strip, thus, presenting a capacitive surface impedance).

Claim 23: *Yamamoto* teaches the cavity is formed using a printed circuit board substrate with the first device being printed on a top layer (fig. 1) of the substrate and plated through holes (29) connecting the top layer to a bottom layer (fig. 1) which forms an opposite boundary, the plated through holes thereby forming sides of the cavity (fig. 2).

Claim 24: *Yamamoto* teaches the emitter is printed (The limitation "the emitter is printed" merely recites a method of forming a device. The method of forming a device is not germane to the issue of patentability of the device itself, therefore, this limitation has not been given patentable weight) on an inner layer of the substrate (fig. 1).

14. Claim 25 is rejected under 35 U.S.C. 102(b) as being anticipated by *Bernhard Rembold* (DE3210895, hereinafter *Rembold*).

Claim 25: *Rembold* teaches an choke comprising a conductive cavity (fig. 1), one boundary of which is formed by a set of annular, concentric devices (2, fig. 1) for controlling electromagnetic radiation emitted by a structure, the concentric devices having a reactive element comprising an array of conductors (2) disposed on a dielectric surface (1) such that the displacement between a conductor and any other conductor adjacent to it is small compared to the wavelength of the electromagnetic radiation thereby causing the array of conductors to represent an effectively continuous conductive surface to the electromagnetic radiation (Since rings 2 are metal they will induce a capacitance between each ring, thus, presenting effectively continuous conductive surface), wherein the surface impedance of the conductive surface is reactive with regions of dielectric disposed there between (fig. 1).

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

16. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Noujeim* in view of *Iwai*.

Claim 14: *Noujeim* teaches all of the limitations of claim 13, as discussed above. *Noujeim* fails to teach an actuating mechanism for adjusting the displacement between the equipotential surface and the reactive element so that the angle of propagation of the beam of

electromagnetic radiation that leaks through the reactive element can be varied. However, *Iwai* teaches using an actuating mechanism for adjusting the displacement between the equipotential surface and the reactive element so that the angle of propagation of the beam of electromagnetic radiation that leaks through the reactive element can be varied (Abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined the actuating mechanism of *Iwai* to the invention of *Noujeim* since both are known methods of performing the same function, i.e. beam steering.

Claim 15: If the modifications to the invention of *Noujeim* were made, as discussed above, one with ordinary skill in the art would have realized the actuating mechanism comprises a hydraulic actuator or a piezoelectric actuator, or an electric motor (Abstract of *Iwai*).

17. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Noujeim* in view of *Varadan* (US 5,557,286, hereinafter *Varadan*).

Claim 17: *Noujeim* teaches all of the limitations of claim 13, as discussed above. *Noujeim* fails to teach the active dielectric is titanium dioxide. However, *Varadan* teaches using barium strontium titanate since it exhibits highly tunable dielectric constants which enable a substantial variation in an electrical phase shift there through (col. 3/lines 60-64). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used barium strontium titanate as the active dielectric of *Noujeim* since it exhibits highly tunable dielectric constants which enable a substantial variation in an electrical phase shift there through.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT KARACSONY whose telephone number is (571)270-1268. The examiner can normally be reached on M-F 7:30 am - 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas W. Owens can be reached on 571-272-1662. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/R. K./
Examiner, Art Unit 2821

/Hoang V Nguyen/
Primary Examiner, Art Unit 2821